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Research Article

COMPARISON OF RELAPSE RATES OF DEPOT AND ORAL ANTIPSYCHOTICS IN PATIENTS WITH SCHIZOPHRENIA

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ABSTRACT

Introduction: Antipsychotics are the mainstay of treatment in schizophrenia. First-generation and second-generation antipsychotics are available as oral and depot formulations. The aim of this study was to compare the relapse rate in patients with schizophrenia treated with depot and oral antipsychotics.

Methods: All patients diagnosed with schizophrenia under the Top End Mental Health Service in Darwin, Australia during a period of five years were included. Their medications and history of relapses were retrieved from electronic records. Mean relapses-per-month was calculated and compared using the independent t-test and ANOVA.

Results and discussion: The study sample contained 193 patients; 137 were males. The mean relapses-per-month for oral formulations was significantly higher than for depot formulations. Second-generation antipsychotic depot formulations had significantly reduced mean relapses-per-month compared to oral second-generation formulations. The mean relapses-per-month for first-generation antipsychotics depot was not significantly different from first-generation depot formulations. First-generation antipsychotics depot formulations were significantly more effective than oral second-generation. Zuclopenthixol appeared to be the best first-generation antipsychotics depot compared to flupenazine and flupenthixol. First-generation antipsychotics depot formulations were equally effective as Second-generation antipsychotics depot formulations.

Conclusion: Depot formulations overcome some of the adherence problems with oral therapy, and the resultant continuous therapy is effective in reducing relapse rates.

INTRODUCTION

The Swiss psychiatrist, Eugen Bleuler, coined the term, "schizophrenia" in 1911. In addition, he was the first to classify the symptoms of schizophrenia as "positive" or "negative." The word "schizophrenia" has a Greek origin, which is schizo (split) and phrene (mind) to describe the fragmented thinking of people with the disorder[1]. Other than a difference in the duration of symptoms to meet the requirement for diagnosis (6 months for DSM-V and 1 month for ICD-10), both classification systems share substantial similarities in their diagnostic criteria.

A key factor in management is the occurrence of relapses during the course of the disease and associated deterioration in brain functioning, making prevention a major treatment goal. Relapse represents a significant burden to all healthcare systems including the high cost of hospital care, post hospital follow-up and medication costs[2,3]. They also cause deterioration of the psychosocial well-being of the individual, due to impairment of the global functional level[4,5]. They affect the individual's scholastic skills, occupation and interpersonal relationships[5,6]. Further, the stigma and discrimination associated with mental illness tends to worsen[2,4]. Eventually, individuals with schizophrenia and frequent relapses carry a significant risk of suicide[7]. Improving medication adherence is key to relapse prevention[5,8], with a 2–6 times higher risk without medication[4,9,10-12].

Reasons for medication non-adherence include; willful refusal, forgetfulness, disorganization, lack of insight, and cognitive dysfunction. Additional factors may be; stigma, adverse effects of medication, cost, and lack of perceived efficacy[13,14]. Improving adherence to psychotropic medication, requires the choice of an effective and safe antipsychotic agent and to optimize treatment according to the response and its tolerability to the individual[2]. However, the choice of medication is complicated by the variety of available

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pharmaceuticals and specific considerations for the unique differences in patients' individualized response to the same medication, both clinical outcomes and side effects[15]. Once an antipsychotic medication is selected, the challenge is the mode of delivery and effective dose for an individual. There are two main routes for administration of antipsychotic medications; oral (tablets) and intramuscular (depot/ long acting injectable preparations).

Evidence suggests that depot antipsychotics are more effective in reducing relapses in schizophrenia[1,16-20]. They are recommended to treat non-adherent patients[21]. However, patients and clinicians are sometimes reluctant to use them because of stigma, needle pain, time constraints, side effect concerns and the cost[22].

While this study was conducted in Australia, the intention was to relate the findings to the Sri Lankan situation where the principle researcher resides. In the Sri Lankan context, both first-generation antipsychotics (FGA) and second-generation (SGA) antipsychotics are prescribed either in oral, depot or both forms. Among oral FGA, the more commonly used medications are chlorpromazine, haloperidol and trifluoperazine while commonly used depot FGA are fluphenazine, flupenthixol and zuclopenthixol.

The more frequently prescribed oral SGA preparations are olanzapine, risperidone, quetiapine and aripiprazole. SGA depot preparations of risperidone, paliperidone, olanzapine and aripiprazole are not used in government hospitals in Sri Lanka mainly due to their cost. SGA are sometimes used in the private sector. Some researchers suggest that the SGAs are superior in reducing relapses compare to FGAs. This study aimed to compare the relapse rate with oral and depot antipsychotics and to examine the relapse rates among different antipsychotics.

METHODS

This study was a retrospective comparative study reviewing medical records of patients who were diagnosed with schizophrenia and who were referred to one of the two mental health clinics in Darwin in the Northern Territory (NT) of Australia. All patients diagnosed with schizophrenia and referred during the period of January 2010 to December 2014 were included in this study.

Inclusion criteria

- Patients meeting ICD-10 diagnostic criteria for schizophrenia and being treated for the disorder.
- Patients who were on a particular oral or depot medication continuously at least for 3 months.
- Patients who remained under the care of the service for a minimum period of one year.
- Exclusion criteria
- Patients who dropped out of treatment in less than 12 months.
- Patients for whom the diagnosis was subsequently changed from schizophrenia to other psychotic disorders (e.g. schizoaffective disorder, substance induced psychosis, delusional disorder, schizophreniform disorder).
- Patients who received combination therapy (i.e. oral and depot medication simultaneously).
- Patients who changed the treatment modality from oral to depot of a particular medication or vice versa in less than 3 months.
- Patients who had poor compliance to medications (patients who were not on regular treatment for at least three months of a particular medication) were excluded.

The study sample was selected, and de-identified, by a consultant psychiatrist in the mental health clinic. Their past medical records in the electronic record system, the Community Care Information System (CCIS) were reviewed to retrieve data on socio demographic characteristics, medications and the history of relapses. CCIS, which is the electronic database, stores the records of all psychiatric patients of the NT. It contains information on presenting history, diagnosis, past and present medications, information on relapses and hospitalizations, and assessment details from monthly reviews, including a mental state examination. Recorded diagnoses within CCIS are based upon the ICD-10 classification system. CCIS also contains all the updated records of patients since their initial referral date to the service. To reduce the confounding effects of length of the follow up period on frequency of relapse episodes, a mean relapse per month (MRM) index was calculated[8].

$$\text{MRM index} = \frac{\text{Number of relapses}}{\text{Follow up time (month)}}$$

The lowest numerical value that could be obtained for MRM is 0 and it is assigned when there are no relapses recorded. A lower MRM value implies a low relapse rates and vice versa.
Ethical approval was obtained from the Ethics Review Committee of the Menzies School of Health Research, Darwin, Australia. Permission to conduct this research was obtained from the Director of the Top End Mental Health Service and the Medical Director of the Royal Darwin Hospital to which the clinics are affiliated. The data were analysed using SPSS, version 23, (IBM Analytics NY,USA). Descriptive statistics including frequencies, means and standard deviations (SD) were studied for each variable. The association of both oral and depot antipsychotic formulations with the relapse rate were evaluated by an independent t-test. The significance of each medication in reducing relapses was estimated using ANOVA. $p<0.05$ was considered as statistically significant. Data is presented as percentages and by appropriate diagrams and charts.

RESULTS

Socio-demography

The study sample consisted of 193 patients (70.98% males and 29.02% females), participants between 19 and 69 years of age (Figure 1). Alcohol consumption and illicit substance use were assessed for all patients. Amongst males, 71.5% consumed alcohol and 34.3% also used illicit substances. Among females, 19.6% consumed alcohol and 10.7% used illicit substances. Further, 28.5% of males and 80.4% of females in the sample did not consume either alcohol or substances. Many patients experienced different medications during the five-year study period with the intention of improving therapeutic outcome. For inclusion in the study, patients required to be treated with a particular medication for more than 3 months during the study period. In the instances

where patients had been treated with more than one drug during the study period with no overlap of medication, each medication trial was considered as a separate **'case'** in data analysis. The Mean MRM Index was calculated for each medication as well as for the different preparations of each medication. Table 1.

Table 1 Frequencies and mean MRMs of each medication

Medication type	Medication	Mode of administration	Number of cases	Mean of MRM (SD)
SGA	Aripiprazole	Oral	17	0.1042 (0.0997)
	Aripiprazole	Depot	2	0.0000 (0.0000)
	Olanzapine	Oral	65	0.1087 (0.0471)
	Paliperidone	Oral	25	0.1030 (0.0338)
	Paliperidone	Depot	72	0.0423 (0.0454)
	Quetiapine	Oral	15	0.0773 (0.0331)
	Risperidone	Oral	50	0.1058 (0.0271)
	Risperidone	Depot	69	0.0697 (0.0432)
	Ziprasidone	Oral	1	Not reported
	Amisulpride	Oral	5	0.0886 (0.0529)
	Clozapine	Oral	57	0.0171 (0.0330)
FGA	Chlorpromazine	Oral	8	0.0552 (0.0523)
	Flupenazine	Depot	13	0.0903 (0.0425)
	Flupenthixol	Depot	20	0.0806 (0.0568)
	Haloperidol	Oral	2	0.0500 (0.0707)
	Haloperidol	Depot	5	0.0467(0.0462)
	Zuclopenthixol	Depot	56	0.0417 (0.0443)

Comparison of oral and depot antipsychotics

The mean MRM of oral and depot antipsychotics in the total sample were compared using an independent sample t-test. Patients receiving clozapine were excluded from this calculation. There were 188 cases on oral and 237 cases on depot medications in the sample. The mean MRM of oral medications was significantly higher (p<0.0001) compared to depot medications (Table 2). This suggests that oral antipsychotics were less effective than depot antipsychotics in controlling relapses in patients with schizophrenia.

Table 2 Comparison of oral and depot antipsychotics

Medication type	Frequency	Mean MRM	SD	SEM
Oral	188	0.1003	0.0495	0.0036
Depot	237	0.0557	0.0480	0.0031

The comparison of MRMs between oral and depot FGA medications are listed in table 3. The number of cases reported for oral FGAs were very low (n=10) compared to depot FGAs (n=94). Therefore, a random sample of depot FGA cases (n=10) were compared with oral FGAs using the independent sample t-test. The results indicate that the mean MRM of oral and depot FGAs were not significantly different (p>0.05).

Table 3 Comparison of oral and depot FGA formulations

Medication type	Frequency	Mean MRM	SD	SEM
FGA oral	10	0.0542	0.0519	0.0164
FGA Depot	94	0.0570	0.0506	0.0052

A total of 321 cases were reported for SGAs therapy and among them, 178 were for oral medications while 143 were for depot preparations. Using the independent sample t-test, results indicate that depot SGAs significantly reduced (p<0.0001) MRM compared to oral SGAs in patients with schizophrenia (Table 4).

Table 4 Comparison of oral SGAs and depot SGAs

Medication type	Frequency	Mean MRM	SD	SEM
SGA oral	178	0.1029	0.0482	0.0036
SGA Depot	143	0.0549	0.0464	0.0039

The comparison of MRMs between oral FGA and SGAs is illustrated in table 5. The number of cases on oral FGA was relatively low compared to oral SGA cases, so again, a random sample (n=10) of oral SGAs were compared with oral FGAs using the independent t-test. The results indicated no significant difference between the mean MRM (±SD) of oral FGAs (0.0542 ± 0.0519) and oral SGAs (0.0880 ± 0.0412, p>0.05)

Table 5 Comparison of FGA and SGA oral antipsychotics

Drug category	Frequency	Mean MRM	SD	SEM
FGA oral	10	0.0542	0.0519	0.0164
SGA oral	178	0.1029	0.0482	0.0036

The MRM in patients on depot FGAs and SGAs were analysed by independent sample t-test. There were 94 cases reported for FGAs and 143 for SGAs. Table 6 illustrates the mean MRM of each group. There was no significant difference (p>0.05).

Table 6 Comparison of MRM in patients with Depot preparations

Drug category	Frequency	Mean MRM	SD	SEM
FGA depot	94	0.0570	0.0506	0.0052
SGA depot	143	0.0549	0.0464	0.0039

Since the number of cases was not equal for the two drug groups, a random sample of 94 SGAs cases was compared with the total depot FGAs cases, further confirming no significant difference between the groups(p>0.05).

Depot FGAs and oral SGAs were compared indicating that depot FGAs (0.0570 ± 0.0506) were significantly more effective (p<0.0001) than oral SGAs (0.1071 ± 0.0491) in reducing the relapse rate.

Table 7 Comparison of oral SGAs and depot FGAs

Drug category	Frequency	Mean MRM	SD	SEM
FGA depot	94	0.0570	0.0506	0.0052
SGA oral	178	0.1029	0.0482	0.0036

Conversely, a random sample of depot SGAs cases was compared with cases on oral FGAs showing no significant difference (p>0.05) between mean the MRM for depot SGAs and oral FGAs medications (Table 8).

Table 8 Comparison of oral FGA and depot SGAs

Drug category	Frequency	Mean MRM	SD	SEM
FGA oral	10	0.0542	0.0519	0.0164
SGA depot	143	0.0549	0.0464	0.0039

The mean MRM of patients treated with clozapine was compared with depot FGAs and SGAs by one-way ANOVA test, followed Bonferroni post-hoc test. The mean MRM of clozapine treated cases was significantly lower when compared to the mean MRM of both depots FGAs (p<0.05) and SGAs (p<0.05) (Table 9).

Table 9 Comparison of clozapine and depots antipsychotics

Drug category	Frequency	Mean	SD	SE	Minimum	Maximum
FGA depot	94	0.0570	0.0506	0.0052	0.0000	0.2500
SGA depot	143	0.0549	0.0464	0.0039	0.0000	0.2000
Clozapine	56	0.0174	0.0332	0.0044	0.0000	0.2000

Using one-way ANOVA followed by Bonferroni post-hoc test to compare clozapine cases with oral FGAs and SGAs revealed the mean MRM of clozapine treated patients was significantly lower compared to the MRM of oral SGAs treated cases (p<0.05). There was no significant difference between the mean MRM of clozapine and oral FGAs treated

cases (p>0.05). However, the sample size of oral FGAs treated cases was small (n=10) (Table 10).

Table10 Comparison of Clozapine and other oral antipsychotics

Drug category	Frequency	Mean MRM	SD	SE	Minimum	Maximum
FGA oral	10	0.0542	0.0519	0.0164	0.0000	0.1250
SGA oral	178	0.1029	0.0482	0.0036	0.0000	0.3333
Clozapine	56	0.0174	0.0332	0.0044	0.0000	0.2000

Table 11 shows the mean MRM of different oral SGAs. This sample did not follow the Levens statistics homogeneity of variance rule (p<0.0001) and hence, the independent samples Kruksal Walis test was performed to assess the significant differences in distribution of MRM across the groups. This indicated no significant difference (p=0.106) between the SGAs at the 95% confidence interval.

Table 11 Comparison of oral SGAs

Medication	Frequency	Mean MRM	SD	SE	Minimum	Maximum
Aripiprazole	17	0.1042	0.0997	0.0242	0.0000	0.3333
Olanzapine	65	0.1087	0.0471	0.0058	0.0000	0.3333
Paliperidone	25	0.1030	0.0338	0.0068	0.0000	0.1667
Quetiapine	15	0.0773	0.0331	0.0085	0.0000	0.1250
Risperidone	50	0.1058	0.0271	0.0038	0.0526	0.1667
Amisulpride	5	0.0886	0.0529	0.0236	0.0000	0.1429

Three depot SGAs were used in the treatment of patients with schizophrenia in this study (Table 12). The sample size for aripiprazole was small and it was considered inappropriate to include in this analysis. The mean MRM of paliperidone and risperidone were compared using the independent t-test showing that the mean MRM of paliperidone treated patients was significantly lower than that of risperidone (p< 0.0001).

Table 12 Comparison of depot SGAs

Medication	Frequency	Mean MRM	SD	SE	Minimum	Maximum
Aripiprazole	2	0.0000	0.0000	0.0000	0.0000	0.0000
Paliperidone	72	0.0423	0.0454	0.0054	0.0000	0.2000
Risperidone	69	0.0697	0.0432	0.0052	0.0000	0.1667

Comparison of depot FGAs

Flupenazine, flupenthixol, haloperidol and zuclopenthixol were the depot FGAs used to treat patients with schizophrenia in this study sample. The mean MRM of each medication is listed in table 14. Means of these four medications were compared by One-way ANOVA test followed by Bonferroni post-hoc test. The mean MRM of zuclopenthixol was significantly lower compared to both flupenazine (p=0.007) and flupenthixol (p=0.012).

Table 14 Comparison of depot FGAs

Medication	Frequency	Mean MRM	SD	SE	Minimum	Maximum
Flupenazine	13	0.0903	0.0425	0.0118	0.0000	0.1667
Flupenthixol	20	0.0806	0.0568	0.0127	0.0000	0.2500
Haloperidol	5	0.0467	0.0462	0.0207	0.0000	0.1000
Zuclopenthixol	56	0.0417	0.0443	0.0059	0.0000	0.2000

Comparison of MRM of patients treated with both oral and depot antipsychotics

The sample contained 114 patients who had been treated with both oral and depot medications at different times during the study period. The MRM of these patients were compared using the paired sample t-test. The mean MRM of depot antipsychotic medications was significantly lower than oral antipsychotic medications (p<0.05) as indicated in (Table 15).

Table 15 Comparison of MRM in patients treated with both oral and depot antipsychotics

Medication type	Mean MRM	Frequency	SD	SEM
oral	0.1048	114	0.0459	0.0043
depot	0.0441	114	0.0366	0.0034

DISCUSSION

In schizophrenia, a health professional's main intention is to prevent relapses and maintain functional status and wellbeing[8]. There are modifiable and non-modifiable risk factors associated with the relapse rate of patients with schizophrenia. Age, gender and genetic predisposition are important among non-modifiable risk factors, while medication adherence, substance use and life stresses are predominant in modifiable risk factors[8].

Selecting an effective, safe and well tolerated antipsychotic agent is challenging at times due to the diversity of available medications and specific considerations for every individual patient[15]. This retrospective comparative study was conducted to examine the relative beneficial effects of using depot preparations compared with oral antipsychotic medications. The relapse rates of patients with schizophrenia who were on either oral or depot antipsychotic medications were compared initially. It revealed that overall, depot antipsychotics appeared to be more effective than oral antipsychotics in controlling relapses in schizophrenia in this patient population. The patients who were treated with both oral and depot antipsychotic medications at different times were examined to try to reduce bias of comparing different individuals. This also indicated that depot medications were superior in controlling relapses. This is in keeping with other similar studies. Leuchet *et al*. demonstrated that, depot antipsychotic drugs reduce the relapse rate by 30%[23]. Further, a recent mirror-image study showed long acting injectables were superior to oral medications in reducing hospitalization[24]. However, the impact of compliance in the superiority of depot preparations over orals in preventing relapses is difficult to quantify and this is a confounding factor in this study as well. Side effects and lack of insight are the two main factors contributing to medication non-adherence in patients with schizophrenia[25], with 66% of patients cited adverse effects as their primary reason for non-adherence. Depot formulations are considered the most successful pharmacological intervention to address non-adherence in schizophrenia[13,26]. Depot preparations are administered by a health care professional (doctor or a nurse) and therefore, missing an appointment for their injection is easily noticeable[27,28], and once the medication has been injected, the effects will be there for an extended period, whether the patient finds the side-effects acceptable or not. In contrast, compliance with oral medication can be erratic. They are usually taken at home and not monitored. Parenteral preparations are not influenced by first-pass metabolism and are efficient in maintaining optimum plasma levels. Consequently, these long acting injectable preparations are often recommended for individuals who have known poor adherence patterns for oral antipsychotics. Some studies demonstrate that the risk of re-hospitalization in patients receiving long acting antipsychotic injections was two-thirds lower than patients receiving the oral equivalent[29,30]. The results of this study again confirmed the superiority of depot SGAs over the oral preparations of the same medication in controlling relapses. A post-hoc analysis of trials showed that the risk of relapse was higher among patients receiving oral paliperidone compared to depot paliperidone[31]. Further, a two-year prospective study showed that the Risperidone depot significantly reduced relapse and improved compliance, relative to oral risperidone[32].This study demonstrated a general pattern where depot SGAs appear superior to oral SGAs. A study which compared the effectiveness of individual

medications revealed a significant advantage of depot risperidone (16% relapse rate) over oral quetiapine (31% relapse rate)[33]. Some studies which used hospitalization as a measure of the relapse rate noted a 46% relapse rate for long acting risperidone and 43% for oral aripiprazole[34]. However, a 2-year study by Rosenheck *et al*.[35] revealed that Risperidone depot did not significantly reduce relapses over oral antipsychotics.

Among the six oral SGAs, olanzapine and risperidone were the most commonly used medications in this study sample. However, the effectiveness of individual orals SGAs in controlling psychotic relapses was similar among the different medications. Although quetiapine showed the lowest relapse rate among oral SGAs, only a small number of patients (n=15) were treated with it, so its superiority over other oral SGAs is not established by this study.

Long acting injectable preparations of paliperidone and risperidone were the most used SGAs in this study sample. Among the depot SGAs preparations, paliperidone depot appears to have a superior effect over risperidone in controlling relapses in schizophrenia. Similar results, indicating that the paliperidone depot significantly reduces the relapse rate of schizophrenia compared to risperidone and olanzapine depots were demonstrated by Bishara[36].

Aripiprazole depot has only been recently introduced to the public health system in Australia and the sample contained only two patients on this drug, so this requires further study.
The usage of oral FGAs is limited at present. In this study, only oral chlorpromazine and haloperidol were prescribed to the sample population. Only ten patients in this sample were treated with these oral FGAs. This appears to be mainly due to the FGAs side effects profile.

The prescription numbers for depot FGAs was comparatively high in this study. Among them, the zuclopenthixol depot was the most frequently used, being administered to 56 patients. Haloperidol was the least used FGA depot, being used on only five patients, possibly due to its likelihood of producing side effects. This was previously noted in a four-month study among inpatients with schizophrenia that demonstrated that haloperidol depot was associated with only a marginally better efficacy but more extra pyramidal side effects, compared to oral haloperidol[30].

This study suggested differences in effectiveness between depot FGAs and oral FGAs, but the small number of patients on oral FGAs precludes any definitive conclusions being drawn from this comparison. Among the depot FGAs used in this sample, zuclopenthixol showed a greater effect in controlling relapses compared to flupenthixol, fluphenazine and haloperidol. A 21-month study by Del Giudice *et al*.[37] showed that fuphenazine depot was superior to oral Fluphenazine in reducing relapses in patients with schizophrenia[30,37]. There is also evidence to suggest that patients treated with haloperidol or fluphenazine long-acting injections had a significantly longer mean time to medication discontinuation and were twice as likely to stay on medication, compared to patients treated with oral haloperidol or fuphenazine[30]. The data from this study is insufficient to verify this. Some studies have demonstrated a superior effect of oral SGAs over oral FGAs in relapse prevention. This study did not show a significant effect with oral SGAs due to the very small sample of patients treated with FGA's, however the very low numbers be explained by the previous study findings. Antipsychotic therapy evolved from first generation to second generation agents gradually as the latter group gave rise to comparatively less side effects and hence encouraged better adherence. A meta-analysis by Leucht *et al*.[11] compared the effectiveness of nine second generation antipsychotics with first generation antipsychotics in schizophrenia. The results revealed that second generation antipsychotics were significantly more effective than first generation antipsychotics. In this study, though there were patients treated with depot FGAs and SGAs, no superiority was observed in either medication groups in reducing relapses of schizophrenia. In contrast, depot FGAs demonstrated dominance over oral SGAs in controlling relapses in patients with schizophrenia.
The results of a systematic review, carried out to compare depot FGAs with both oral FGAs and SGAs, showed an overall clinical advantage in preventing relapses among depot FGAs[38]. However, evidence over the years does not provide unequivocal data in the use of long acting injectable FGAs[25,38]. Kishimoto *et al*. reported an overall relapse rate of 37% among patients receiving FGAs, while the relapse rate of those on SGAs was 29%[24].

The results of this study suggest that zuclopenthixol is the most effective FGA depot in preventing relapses of schizophrenia. Substance and alcohol abuse is common among patients with schizophrenia and relapses show a strong correlation with substance use. In this study a number of patients used substances and alcohol, although the percentage of women using alcohol or substances was comparatively low. However, as records were obtained retrospectively, they depended on patients disclosing substance misuse and may not have been entirely accurate. A follow up study of patients with schizophrenia showed that 24% of individuals abused either alcohol or illicit substances and 72% of illicit substance users had experienced at least one episode of hospitalization[30].

Extrapolating to the Sri Lankan health environment, depot preparations are used commonly in managing schizophrenia. Sri Lanka does not have a well-established community mental health care network and few community treatment centers. It does not possess a comprehensive network of case managers. Further, with limited financial, human and infrastructure resources for mental health there is no system to effectively monitor medication compliance among patients. Therefore, treatment dropouts are common. Moreover, patients are reluctant to use long-term medications due to stigma. Considering all these factors, the use of depot antipsychotic medications could be considered as a more reliable and effective tool to ensure patient compliance with treatment for a country such as Sri Lanka. This in turn could prove cost-effective by preventing relapses and potential hospital admissions. Depot FGAs are widely used in Sri Lanka. However, depot SGA formulations are less popular due to higher acquisition cost. They are occasionally prescribed in the private sector, but use in the government hospitals is unlikely in the near future. The finding in this study that depot FGAs were equally effective as depot SGAs encourages the continued use of depot FGAs in the Sri Lankan setting which can be sustained due to its lower cost.This study was conducted in a population outside Sri Lanka. However, the study sample was mostly of Asian descent (mainly from China, India, Pakistan, Bangladesh, Sri Lanka and Nepal) which minimized the biological and cultural factors that could affect the results of this study.

CONCLUSION

The main findings of this study are

1. Depot antipsychotics were superior to oral antipsychotics in reducing relapses in patients with schizophrenia.
2. Depot SGAs were more effective than oral SGAs in reducing relapses in patients with schizophrenia.
3. Depot FGAs were equally effective as depot SGAs in reducing relapses in patients with schizophrenia.

Limitations

The main limitations of this study are

1. Data collection was retrospective and done only over a five-year study period.
2. The sample consisted of a low number of patients treated with oral FGAs.
3. Effective comparison of newer medications such as aripiprazole depot could not be done because it was introduced only recently and was used on a limited number of patients.

Recommendations

It would be ideal to conduct a similar study in a Sri Lankan population to further evaluate the findings of this study.
This study suggests that the use of depot FGAs could be as effective as using depot SGAs. A study directly comparing these two treatment modalities conducted in a Sri Lankan setting could yield valuable findings which could be utilised to plan treatment strategies at a national level in Sri Lanka.

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